DESCRIPTION

CONTENT DISTRIBUTION SYSTEM AND CONTENT LICENSE MANAGEMENT METHOD

TECHNICAL FIELD

5 [0001]   The present invention relates to a content distribution system and a content license management method, and more particularly, to a content distribution system comprising a server for distributing encrypted contents and a receiving terminal for decrypting the contents distributed from the server by using view

10 licenses, and a license management method implemented in the system.

BACKGROUND ART

[0002]   As is well known, various contents such as images, music, and programs are distributed on digital broadcasting and Internet

15 from servers of service providers offering contents to receiving terminals of users. These contents contain one or a plurality of resources (such as data files, program files, or the like), and are classified broadly into stream-type and multimedia-type contents. The stream-type contents are video and audio-based

20 contents, containing only stream resources such as MPEG2-TS. The multimedia-type contents contain a plurality of resources such as stream resources, multimedia resources, monomedia resources referred from multimedia resources and the like. The multimedia resources are, for example, HTML generally used on Web pages, BML

25 generally used on digital broadcasting, or the like. The monomedia

resources are, for example, MPEG used for moving images; GIF, JPEG and PNG used for still images; MNG used for animation; MPEG2-AAC used for audio; and the like. In the multimedia resources, textual information to be displayed on a screen; reference, to be added

5   to the textual information and presented, to monomedia resources; hyperlink to other multimedia resources; and the like can be described.

[0003]   In general, a service provider subjects copyrighted contents to encryption so as to allow only authorized users to

10   view the contents. When a user desires to view contents which have been encrypted, the user obtains view licenses containing decryption keys issued by the service provider through paying a charge, providing personal information, or the like, and subjects the encrypted contents to decryption (see Patent document 1).

15   [0004]   In principle, one view license is provided for one piece of content, but sometimes a plurality of view licenses are provided thereto. For example, it is desired to vary usage rules regarding a period during which viewing is allowed, limitation on resources on which viewing is allowed, and the like. Although this can be

20   easily achieved by providing a plurality of servers with resources encrypted by varying keys corresponding to respective usage rules, large-capacity servers are required because the same resources have to be redundantly stored. In order to avoid wasting server resources, therefore, a method called sub-license, for example,

25   has been proposed (see non-patent document 1).

[0005] In this sub-license method, a key used for encryption of a resource is doubly encrypted further by another common key. For example, consider a case where it is desired to set two usage rules for a given resource, i.e., periods of one or two weeks. In this case, a resource encrypted by a key A and the key A encrypted by a key B are stored in a server for first one week. A resource encrypted by a key C and the key C encrypted by the key B are stored for next one week. A user who wants to view the resource for one week obtains a view license containing the key A (or the key C), and subjects the resource to decryption by using the key A (or the key C). On the other hand, a user who wants to view the resource for two weeks obtains a view license including the key B, subjects the key A to decryption by using the key B, and subjects the resource to decryption by using the key A for the first one week; and subjects the key C to decryption by using the key B, and subjects the resource to decryption by using the key C for the next one week.

Patent document 1: Japanese Laid-Open Patent Publication No. 2002-342518

Non-patent document 1: "CONDITIONAL ACCESS SYSTEM SPECIFICATIONS FOR DIGITAL BROADCASTING", p15-25, ARIB STD-B25 4.1 version, by Association of Radio Industries and Businesses, June 5, 2003

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0006] As described above, for the multimedia-type contents which are copyrighted and contains a plurality of resources, a

service provider offers one or a plurality of view licenses per content, with the plurality of resources in one piece of content being a unit (scope) targeted for licensing. With the conventional method, however, there is no way of knowing, on a user's receiving

5 terminal, a relationship between a resource and a piece of content, which is set by a service provider. Accordingly, it is unable to determine to which piece of content a resource belongs, that is, to which view license the resource corresponds, upon accessing the resource. In addition, when a plurality of varying encryption

10 codes are used for resources in one piece of content, the conventional method has, on a user's receiving terminal, no way to easily grasp a relationship between resources and encryption codes, which is set by service providers.

[0007] Therefore, the conventional method, as in the above

15 patent document 1, has a problem that it is necessitated to add information for identifying view licenses required for decryption (for example, license IDs and decryption keys) to all encrypted resources in a piece of content (shaded areas in FIG. 12), and to perform license matching processing between the above-mentioned

20 information and information which a receiving terminal has, each time the receiving terminal accesses the resources. In particular, when a plurality of view licenses are provided for one piece of content as in the above non-patent document 1, it is necessitated to add respective pieces of information for identifying the

25 plurality of view licenses to all encrypted resources in the content.

This kind of license matching processing for each resource access may cause a delay of view processing on a receiving terminal.

[0008]   Therefore, an object of the present invention is to provide a content distribution system and a content license management method which enable identification of a view license corresponding to a resource on a user's receiving terminal immediately at the time of accessing the resource without adding, to resources in a piece of content, any information for identifying a plurality of view licenses.

SOLUTION TO THE PROBLEMS

[0009]   The present invention is directed to a content distribution system which comprises a server for storing at least one contents including a plurality of resources and a receiving terminal for receiving a distribution of contents from the server, and to a license management system implemented in the content distribution system. To achieve the above object, the present invention has the following aspects.

[0010]   The server comprises: a content storage section operable to store the content which contains an upper-level resource to be first referred to within the content, at least one lower-level resource that can be referred to from the upper-level resource, and a startup document providing at least a plurality of pieces of license information, corresponding to either one of reference destination information of the upper-level resource and a predetermined usage rule, for identifying a view license required

for viewing all or a part of the resources contained in the content; and in which information for referring to a startup document of other content is described in link information for accessing resources of other content; and a communication processing section operable to receive a presentation request for a resource from the receiving terminal, and when the requested resource is not the startup document, to present the resource to the receiving terminal and when the requested resource is the startup document, to present the upper-level resource to the receiving terminal, and to provide the receiving terminal with the plurality of pieces of license information based on a description of the startup document.

[0011]   The receiving terminal comprises: a communication processing section operable to receive the plurality of pieces of license information provided from the server; and a view processing section operable, each time a plurality of pieces of license information are provided, to set, for view processing, a plurality of view licenses identified by the plurality of pieces of license information and to execute view processing on a resource provided from the server by using the set plurality of view licenses. The receiving terminal may obtain a plurality of view licenses which are set for view processing, from the server or from a license server other than the server. And the receiving terminal may further comprise a content storage section for storing all or a part of contents that the server has stored.

[0012]   Main features of the license management method of the present invention are that when a content containing a resource of which presentation is requested from the server is altered, the server provides the receiving terminal with a plurality of

5   pieces of license information associated with a new piece of content, and that when the plurality of pieces of license information are provided from the server, the receiving terminal executes the view processing of a resource distributed from the server by using the plurality of view licenses identified by the plurality of pieces

10   of license information until next license information is newly provided.

[0013]   More specifically, the server determines whether or not a resource of which presentation is requested from the receiving terminal is a startup document, and when the resource is not the

15   startup document, the server presents the requested resource to the receiving terminal, and when the resource is the startup document, the server presents to the receiving terminal an upper-level resource based on a description of the startup document and provides the receiving terminal with the plurality of pieces

20   of license information. The receiving terminal receives the plurality of pieces of license information provided from the server, each time the plurality of pieces of license information are provided, sets, for view processing, the plurality of view licenses identified by the plurality of pieces of license information and

25   executes the view processing of the resource distributed from the

server by using this set plurality of view licenses.

[0014]   Typically, in respective pieces of license information of a startup document, information for identifying a view license containing at least one decryption key provided for a resource

5   in the content is described, and the receiving terminal identifies the plurality of view licenses based on the information for the identification, and performs decryption of resources by using the keys which the identified plurality of view licenses contain.

[0015]   Here, in the license information of the startup document,

10   information showing a relationship of correspondence between respective encrypted resources and keys for decrypting the encrypted resources is further described, and referring to the relationship of correspondence, the receiving terminal is preferably capable of uniquely identifying the keys for decryption

15   of resources.

[0016]   Preferably, this content license management method is provided in a form of a program in which a series of procedures are executed by the server and the receiving terminal which the content distribution system comprises.   This program may be

20   recorded on a recording medium which is computer-readable.

EFFECT OF THE INVENTION

[0017]   As described above, according to the present invention, license information for each content (a startup document with the license information described) is previously generated on the side

25   of the server and the license information (of the startup document)

is provided to a receiving terminal only when a target content to be viewed is altered. And each time license information is provided, the receiving terminal sets newly at least one view license corresponding to the license information for decryption

5   of resources. This processing allows the receiving terminal to easily grasp that once license information is provided, all resources to be viewed belong to the same content until next license information is newly provided. Thus, it is not required to perform license matching processing for checking, each time a resource

10 to be viewed is altered, whether or not the resource belongs to a content containing a view license.

[0018]   In addition, when license information contains information representing a relationship of correspondence between respective resources of one content and decryption keys, matching

15 of a resource and a decryption key can easily be conducted on the side of the receiving terminal. And a service provider only specifies a reference destination of a startup document as an access destination of a content irrespective of kinds of contents, resulting in easier management of a content selection screen or

20 the like. And because information associated with keys and resources are separated, in a case where it is needed to contain one particular resource in a plurality of contents respectively, the plurality of contents can share the one particular resource subjected to predetermined encryption and decryption keys can be

25 described in respective startup documents. Further, decryption

processing can be performed in a collective manner irrespective of kinds of resources, resulting in easier processing on the side of the receiving terminal.

5 BRIEF DESCRIPTION OF THE DRAWINGS

[0019]   [FIG. 1] FIG. 1 is a schematic block diagram illustrating of a content distribution system according to a first embodiment of the present invention.

[FIG. 2] FIG. 2 is a block diagram illustrating an example
10 of an internal structure of a content stored in a content storage section 12.

[FIG. 3] FIG. 3 is a diagram showing a logical directory structure of a content 121 shown in FIG. 2 on a server 10.

[FIG. 4] FIG. 4 is a diagram showing one example of a
15 startup document 12a contained in a piece of content.

[FIG. 5] FIG. 5 is a diagram showing one example of a license-corresponding document 12b contained in a piece of content.

[FIG. 6] FIG. 6 is a diagram showing description rules of the startup document 12a.

20 [FIG. 7] FIG. 7 is a diagram showing examples of view licenses stored in a license storage section 13.

[FIG. 8] FIG. 8 is a flowchart showing procedures of a license management method according to the first embodiment of the present invention.

25 [FIG. 9] FIG. 9 is a schematic block diagram illustrating

a content distribution system according to a second embodiment of the present invention.

[FIG. 10] FIG. 10 is a flowchart showing procedures of a license management method according to the second embodiment of the present invention.

[FIG. 11] FIG. 11 is a schematic block diagram illustrating a structure of a content distribution system according to a third embodiment of the present invention.

[FIG. 12] FIG. 12 is a block diagram illustrating an example of an internal structure of a conventional content.

DESCRIPTION OF THE REFERENCE CHARACTERS

[0020]   10, 40 and 50   server

11, 21, and 22   communication processing section

12   content storage section

13   license storage section

20, 60, and 70   receiving terminal

23   presentation processing section

24   operation section

25   presentation section

26   license-corresponding document storage section

27   license storage section

28   content storage section

30   communication path

121-12n, 281, and 282   contents

12a   startup document

12b   license-corresponding document

12c   sub-licenses

12d-12f   resources

131-13n   licenses

BEST MODE FOR CARRYING OUT THE INVENTION

[0021]   In the following embodiments, examples of a content distribution system in which encrypted contents have been stored in a server on the side of a service provider, and in order to view the encrypted contents on a receiving terminal on the side of a user, it is necessary to obtain predetermined view licenses and subject the contents to decryption will be described.

[0022]   (first embodiment)

FIG. 1 is a schematic block diagram illustrating a content distribution system according to a first embodiment of the present invention. As shown in FIG. 1, the content distribution system according to the first embodiment contains a server 10 on the side of a service provider and a receiving terminal 20 on the side of a user, which are interconnected via a communication path 30 such as a network. The server 10 contains a communication processing section 11, a content storage section 12, and a license storage section 13. The receiving terminal 20 includes a communication processing section 21, a presentation processing section 23, an operation section 24, a presentation section 25, a license-corresponding document storage section 26, and a license

storage section 27.

[0023]   First, the structure of a content distribution system according to the present embodiment will be described.

On the server 10, the communication processing section

5   11 is a component which realizes a function as an interface on the side of a service provider, for example, distributing contents and providing view licenses in response to a request from the receiving terminal 20. The content storage section 12 stores contents 121-12n (n is an integer greater than or equal to 1),

10   of which structure will be described hereinafter. These contents 121-12n are stored in a state where the contents cannot be used as it is, through using methods such as encryption, and in order to use the contents, view licenses are additionally required. The license storage section 13 has stored view licenses 131-13m (m

15   is an integer greater than or equal to 1) which make available respective contents 121-12n stored the content storage section 12. One or a plurality of view licenses corresponding to each content are provided. These view licenses are provided to the receiving terminal 20 only when a user who has the right to use

20   the view licenses through payment of usage fees in advance or the like makes a request.

[0024]   On the receiving terminal 20, the communication processing section 21 is a component which performs a browsing function such as displaying Web pages, a client application

25   function for system control of the whole terminal pertinent to

content distribution, or the like, and obtains contents, view

licenses, or the like through communication with the server 10.

The presentation processing section 23 makes the obtained contents

usable by using view licenses and outputs the contents to the

5   presentation section 25.   The operation section 24 is an apparatus,

such as a keyboard and a mouse, which receives user's operations

and transmits the operations to the presentation processing section

23.   The presentation section 25 is an apparatus, including, for

example, a cathode-ray tube, a loudspeaker or the like, being

10   operable to present video and audio to users, and presents video

and audio based on instructions from the presentation processing

section 23.   The license-corresponding document storage section

26 stores a license-corresponding document contained in a content

based on instructions from the presentation processing section

15   23.   The license storage section 27 stores view licenses based

on instructions from the presentation processing section 23.

[0025]   Each content 121-12n stored in the content storage

section   12   contains   one   startup   document,   one

license-corresponding document, and at least one resource.   If

20   a sub-license corresponding to a content is provided, the content

further contains the sub-license.   FIG 2 shows one example of a

piece of content 121, including a startup document 12a

[startup.sup], a license-corresponding document 12b

[drminfo.dri], sub-licenses 12c [L200.slc, L300.slc], and

25   resources 12d-12f [foo.htm, bar.htm, gee.htm, a.gif, b.gif, c.jpg,

d.mpg]. Respective resource names are shown in [ ]. The resources

12d-12f are classified into multimedia resources (resources 12d

and 12e in the example in FIG. 2) and monomedia resources (a resource

12f in the example in FIG. 2). As is known in general, in the

5   multimedia resources such as HTML, BML, textual information to

be displayed on a screen; reference, to be added to the textual

information and presented, to monomedia resources; hyperlink to

other multimedia resources, and the like can be described. Among

the media resources 12d-12f which the content 121 contains, the

10   resource 12d which is first presented for, for example, performing

presentation of initial information associated with contents is

called an upper-level resource. Therefore, resources other than

the upper-level resources are lower-level resources.

[0026]   FIG. 3 is a diagram showing a logical directory structure

15   of the content 121 shown in FIG. 2, on the server 10. It is assumed

that the server 10 provides the content 121 as a WWW server and

has a URL "http://sample4foo.panasonic.jp/". In this case, a

monomedia resource "c.jpg" of the contents 121 is to be managed

by   a   URL   "http://sample4foo.panasonic.jp/content

20   121/images/c.jpg".

[0027]   A startup document 12a is an information file provided

for performing license management processing (DRM processing) for

respective resources 12d-12f contained in the content 121, in a

collective manner, where at least a resource name [foo.htm] of

25   the upper-level resource 12d and a document name [drminfo.dri]

of a license-corresponding document 12b are described as reference

destination information (FIG. 4). In the license-corresponding

document 12b, information for identifying a plurality of view

licenses required to view respective resources 12d-12f contained

5   in the content 121 are described (FIG. 5). This information

contains a content ID for identifying a content, a plurality of

pieces of license information which is information associated with

view   licenses   for   making   contents   usable,   and

resource-corresponding information for finding a correspondence

10   between respective resources contained in a content and keys

(decryption keys), required for decryption, in view licenses. In

an example in FIG. 5, a string of characters in an element

"content_id" corresponds to a content ID, each "license" in

elements "licenses" corresponds to a piece of license information,

15   and each "file" in elements "files" corresponds to a piece of

resource-corresponding information.

[0028]   This license information contains a license ID for a

view license, which makes a piece of content usable, and if the

view license is a license which makes a sub-license usable, further

20   contained a resource name of the sub-license. In the example in

FIG. 5, a string of characters in an element "license_id"

corresponds to the license ID, and a string of characters in an

element "sublicense" corresponds to a resource name of the

sub-license. And resource-corresponding information contains a

25   resource name (a string of characters in an element "name" in the

example in FIG. 5) and a corresponding decryption key ID (a string of characters in an element "key_id"). In the example in FIG. 5, a string of characters in an element "name" corresponds to the resource name, and a string of characters in the element "key_id" corresponds to the decryption key ID.

[0029]   FIG. 4 and 5 show examples in which the startup document 12a and the license-corresponding document 12b are described respectively in an XML format, but if pieces of information equivalent to these are described, other document formats may be applicable.   In addition, in the above first embodiment, the startup document 12a and the license-corresponding document 12b are contained as separate resources in the content 121, and the license-corresponding document 12b is to be referred to from the startup   document   12a,   but   the   resources   of   the license-corresponding document 12b may be contained in the startup document 12a and described together therein.

[0030]   Each   sub-license   12c   contains   information, respectively, which makes usable resources other than the sub-licenses in the content 121. The sub-license 12c is data in which files, having resources encrypted by a key and the key further encrypted by a common key, are managed together. Meanwhile, if a startup document is provided in a content which requires no encryption, it is enough to describe only a resource name of the upper resource 12d in the startup document 12a.

[0031]   In addition, if link information for accessing other

contents is described in respective resources, information for referring to the startup document, not information for directly accessing upper-level resources of other contents, is described. This description rule allows a startup document of a content to

5   be referred to only when a view target shifts from one content to another (FIG. 6) and determines shifting status of contents to be viewed.

[0032]   For each encrypted content, one or a plurality of view licenses corresponding to predetermined usages rules have been

10 previously provided, and are uniquely identified by using respective license IDs of license information. The usage rules are conditions regarding view periods such as one week and one month, and conditions regarding view limitation for allowing only specified resources to be viewed.

15 [0033]   View licenses 131-13n stored in a license storage section 13 contain license IDs, usage rules, and key bunches, as exemplified in (a) to (c) of FIG. 7. The license ID is unique information for identifying the view licenses themselves. The usage rules are conditions regarding periods, the numbers of times or the like

20 in a case where contents are made usable by using the view licenses (including a case in which making sub-licenses usable allows indirectly contents to be made usable). The key bunch is a collection of a plurality of decryption keys to actually make contents or sub-licenses usable (that is, to decode encrypted

25 contents or sub-licenses here).

[0034]   In addition, sub-licenses 12c stored in the content storage section 12 contain sub-license IDs, license IDs, usage rules, and key bunches, as exemplified in (d) and (e) of FIG. 7. The sub-license IDs are unique information to identify the

5   sub-licenses themselves. The license IDs are unique information to identify the view licenses required for making the sub-licenses usable. The usage rules are conditions regarding periods, the numbers of times or the like in a case where contents are made usable by using the sub-licenses. There are the cases where usage

10   rules unique to sub-licenses are specified and where usage rules are in accordance with corresponding view licenses. The key bunch is a collection of a plurality of decryption keys to actually make contents usable.

[0035]   Next, referring to FIG. 8, a license management method

15   for viewing contents, which is implemented in content distribution system having the above described structure, according to the first embodiment, will be described. FIG. 8 is a flowchart showing procedures of the license management method performed by the receiving terminal 20.

20   [0036]   When presentation of a new resource is specified by a user via an operation section 24 (including a case where a first resource is presented in a status with no presentation) (step S801), the receiving terminal 20 obtains the specified new resource from the server 10 (step S802). The receiving terminal 20 determines

25   whether or not the obtained new resource is a startup document

(step S803). This determination can be performed by checking a resource name, resource information, or the like. For example, it is identified by header information (content-type header of HTTP or the like) transmitted together with a resource from the server 10 when the resource is obtained from the server 10. When the new resource is not a startup document (No at step S803), the receiving terminal 20 proceeds to step S811 at which a decryption key for the new resource specified by a user is identified.

[0037]   When the new resource is a startup document (Yes at step S803), the receiving terminal 20 obtains a license-corresponding document from the server 10 in accordance with a description of a startup document (reference destination information) (step S804). And the receiving terminal 20 stores the obtained license-corresponding document in a license-corresponding document storage section 26 (step S805). Next, the receiving terminal 20 selects one piece of license information from a plurality of pieces of license information described in the stored license-corresponding document (step S806). As for a method for this selection, a description will be given hereinafter. And the receiving terminal 20 stores in the license-corresponding document storage section 26 a license ID described in the selected one piece of license information (step S807). After the license ID has been stored, the receiving terminal 20 determines whether or not a view license corresponding to the license ID is held, i.e., whether or not the view license corresponding to the license ID has already

been stored in a license storage section 27 (step S808). If not already stored, the receiving terminal 20 obtains from the server 10 the corresponding view license, stores the corresponding view license in the license storage section 27, and sets, for content

5 view processing, the corresponding view license (step S809). After the view license has been set, the receiving terminal 20 obtains from the server 10 an upper-level resource in accordance with the description of the startup document (reference destination information) (step S810).

10 [0038] And based on the set view license, the receiving terminal 20 identifies a decryption key used for decoding the new resource obtained at step S802 or the upper-level resource obtained at step S810 (step S811). After the decryption key has been identified, the receiving terminal 20 performs decryption on the resource by

15 using the decryption key (step S812). The decrypted resource is screen-displayed on the presentation section 25. (step S813). [0039] If a sub-license corresponding to a view license is provided at step S812, however, after the sub-license has been subjected to decryption by using a decryption key contained in

20 the view license, the obtained resource is subjected to decryption by using any decryption key contained in the sub-license. Alternatively, without decryption processing of an encrypted sub-license each time a coded resource is subjected to decryption at step S812, the decryption processing of the encrypted

25 sub-license may be previously performed when the view license is

obtained, stored and set at step S809, and the decrypted sub-license may be used at step S812.

[0040]   Specifically, referring to the above examples in FIG. 2 to 5, license management enabled by this processing will be described as follows.

First, suppose that the receiving terminal 20 has already been presenting some content other than the content 121 and is waiting an instruction for presentation of a new resource at step S801.   Also suppose that in the content being presented, an anchor element

<a_href="http://sample4foo.panasonic.jp/content121/startup.sup"> has been described.   When a user performs an operation to execute a hyperlink in this anchor element (for example, clicking a screen-displayed part corresponding to the anchor element), an instruction to present a new resource "startup.sup" is generated.

[0041]   The generation of the instruction to present the new resource allows processing to proceed from step S801 to step S802. At step S802, the specified resource "startup.sup" is obtained. At step S803, since the specified resource is a startup document 12a, the processing proceeds to step S804.   At step S804, based on a character string "drminfo.dri" in an element "drminfo" of the startup document 12a, a license-corresponding document 12b is obtained from the content server 10.   At step S805, a license-corresponding document of the previous content stored in the license-corresponding document storage section 26 is first

erased, and the license-corresponding document 12b obtained at step S804 is stored in the license-corresponding document storage section 26.

[0042]   At step S806, a plurality of pieces of license information (license elements) in the license-corresponding document 12b are read out and one license to be used is selected. As exemplified hereinafter, there exist a plurality of selection methods.   In this example, a view license B is selected by using any one of the methods. At step S807, a license ID: 200 of the selected view license B is stored in the license-corresponding document storage section 26.   At step S808, it is checked whether or not the selected view license B is stored in a license storage section 27.   Since the selected license B is not stored here, at step S809, the view license B of a license ID: 200 is requested to a license server and obtained.   At step S810, based on a character string "foo.htm" in a start element of the startup document 12a, the upper-level resource 12d is obtained from the content server 10.

[0043]   At step S811, based on the license ID: 200 stored in the license-corresponding document storage section 26, the view license B in the license storage section 27 is identified. And in   resource-corresponding   information   in   the license-corresponding   document   12b   stored   in   the license-corresponding document storage section 26, an element of which a resource name (a character string in an element "name")

is a name of the resource currently being specified is searched, and "452133" is obtained as a corresponding key ID (a character string in an element "key_id"). At step S812, by using the key ID "452133" contained in the view license B identified at step

5   S811, the upper-level resource 12d (foo.htm)is decoded. At step S813, the decoded upper-level resource is presented. And processing returns from step S813 to step S801.

[0044]   Because the upper -level resource 12d has referred to a resource 12f of a.gif, i.e., presentation of the resource 12f

10   of a.gif is instructed, processing proceeds to step S802 and the resource 12f of a.gif is obtained. Next, at step S803, it is determined that the resource 12f is not a startup document. Then, at step S811, a key ID "452142" corresponding to a.gif, which is in the license-corresponding document 12b, is identified. Next,

15   at step S812 and step S813, a resource 12f of a.gif is decoded by using the identified key and presented. And processing returns from step S813 to step S801 and processing for a resource 12f of b.gif is also performed in the same manner as described above.

[0045]   Further, the upper-level resource 12d contains a

20   hyperlink to other resource 12e (bar.htm), and here, suppose that a user performs herein an operation to execute the hyperlink (for example, clicking a corresponding element on a screen), since presentation of a new resource 12d is instructed, this resource is obtained at step S802. Next, at step S803, it is determined

25   that the resource 12e is not a startup document. Then, at step

S811, a key ID "452134" corresponding to bar.htm, which is in the license-corresponding document 12b, is identified. Next, at step S812 and S813, a resource of bar.gif is decoded by using the identified key and presented. And processing returns from step S813 to step S801 and processing for a resource 12f of c.jpg is also performed in the same manner as described above.

[0046] Methods for selecting one piece of license information from a plurality of pieces of license information at step S806 will be described.

(1) Manual selection by a user

In a first method, license IDs and usage rules corresponding to a plurality of pieces of license information in a license-corresponding document are respectively displayed on a screen of the presentation section 25 and are open to selection by a user. In the case of this method, since usage rules are not contained in the license information itself in the above-mentioned examples of the embodiment, it is necessary to inquire as a key a license ID of the server 10. A precondition in this case is that the server 10 has a function of responding to such an inquiry.

[0047] (2) Automatic selection based on purchase information

In general, the information regarding what view license has been purchased by a user is managed on the server 10. Therefore, a license can be selected by using this management information as described hereinafter. First, the receiving terminal 20 inquires the server 10 what view license has been purchased by

a user, by using a user ID as a key. Of course, a precondition in this case is also that the server 10 has a function of responding to such an inquiry. And based on a response from the server 10, the view license which has been purchased is automatically selected

5   from a plurality of pieces of license information. In a case where information regarding what view license has been purchased by a user is managed on the side of receiving terminal 20, however, it is not necessary to inquire the server 10. And if there are a plurality of view licenses which can be automatically selected,

10   a combination of this method and other method such as selection by a user may be used.

[0048]   (3) Automatic selection based on priority

Based on usage rules and usage track records of view licenses, which correspond to a plurality of pieces of license

15   information in a license-corresponding document, a view license to be used is automatically selected. The usage rules include, in general, the following types: absolute allowable usage periods (usable for any number of times until date X), relative allowable usage periods (usable from the first time of use until X days later),

20   allowable total time of use (usable for X days in total), and an allowable number of times of use (usable for X times) or the like. The usage track record refers to what extent a view license has actually been used to. For example, in a case where a usage rule is the allowable total time of use, the usage track record is

25   information regarding a time period for which a view license has

actually been used so far. In a case where a usage rule is an allowable number of times of use, the usage track record is information regarding the number of times a view license actually has been used so far. The usage track records are managed on the receiving terminal 20 in general.

[0049]   On the above basis, a view license can be automatically selected, for example, based on priority described hereinafter. View license whose usage rule is the absolute allowable usage period is used with higher priority than view licenses whose usage rules are the allowable total time of use and the allowable number of times of use. This is because a view license whose usage rules are absolute allowable usage periods can be used without limitation within an allowable period. Between both whose usage rules are the allowable total time of use, a view license which has less remaining time of use (given by subtracting the time period during which a view license has been used so far, from the allowable total time of use) are used with higher priority. And between both whose usage rules are the allowable numbers of times of use, a view license which has a number of fewer remaining times of use (given by subtracting the number of times at which a view license has been used so far, from allowable number of times) is used with higher priority. This is to reduce the number of view licenses, which the receiving terminal 20 has to manage, to as small as possible, which the receiving terminal 20 has to manage, by using view licenses having numbers of fewer remaining times of use, with higher priority

given.

[0050]   As described above, in the content distribution system and the license management method according to the first embodiment of the present invention, a startup document and a license-corresponding document are previously generated for each content on the side of a server, and license information in a license-corresponding document is provided to the side of a receiving terminal only when a content to be presented is altered. And each time license information is provided, the side of the receiving terminal uses a view license corresponding to a license ID of the license information for decryption of resources. In addition, this processing enables the receiving terminal to easily grasp that once license information is provided, all resources presented belong to the same content until the next license information is newly provided. Thus, it is not required to perform license matching processing for checking whether or not a resource belongs to a content having a view license each time a resource to be viewed is altered.

[0051]   In the present invention, since a license-corresponding document contains information representing the relationship of correspondence between respective resources of one content and decryption keys, correspondence between a resource and a decryption key can easily be arranged on the side of the receiving terminal.

In addition, a service provider can specify a reference destination of a startup document as an access destination of a

content irrespective of kinds of contents, resulting in easier

management of a content selection screen or the like.

And because pieces of information associated with keys

and resources are separated, in a case where it is needed to contain

5   a given resource in a structure of a plurality of contents

respectively, the plurality of contents share the given resource

subjected to predetermined encryption and decryption keys can be

described in respective startup documents.

Further, decryption processing can be performed in a

10   collective manner irrespective of kinds of resources, resulting

in easier processing on the side of the receiving terminal.

[0052]   Although in the above first embodiment, the case where

a plurality of resources contained in one content are stored in

the same server is described, these resources may be stored

15   separately in a plurality of servers. And although the case where

startup documents are also stored together with a plurality of

resources in the same server is described, these startup documents

may be separated from the resources and stored collectively in

a different server.

20   [0053]   Further, in the above first embodiment, a method for

accessing startup documents of each content through a menu screen

of Web pages (home pages of Internet shops or the like) or the

like displayed with browsing functions is described. In addition

to this accessing method, other accessing method using metadata

25   in which access destinations of contents (URL) or the like are

described is also considered. In this method, desired metadata is downloaded from a database in which metadata is stored, by using a predetermined application other than a browser, and startup documents of contents are accessed directly through a menu screen generated from this metadata.

[0054]   (second embodiment)

FIG. 9 is a schematic block diagram illustrating a content distribution system according to a second embodiment of the present invention. In FIG. 9, the content distribution system according to the second embodiment of the present invention comprises a content server 40 and a license server 50 on the side of a service provider, and a receiving terminal 60 on the side of a user, which are interconnected via communication path 30 such as network or the like. The content server 40 comprises a communication processing section 11 and a content storage section 12. The license server 50 comprises a communication processing section 11 and a license storage section 13. The receiving terminal 60 comprises a content communication processing section 21, a license communication processing section 22, a presentation processing section 23, an operation section 24, a presentation section 25, a license-corresponding document storage section 26, and a license storage section 27.

[0055]   As shown in FIG. 9, the content distribution system according to the second embodiment is different from that according to the first embodiment in that a server 10 is divided into the

content server 40 and the license server 50; that a communication processing section of a receiving terminal 20 is divided into the content communication processing section 21 and the license communication processing section 22; and that through this

5 structure, content distribution and view license management are separately performed. With a focus on the differences, the content distribution system according to the second embodiment will be described hereinafter.

[0056] The communication processing section 11 in the content

10 server 40 performs content distribution or the like in response to a request from the receiving terminal 60. The communication processing section 11 in the license server 50 provides view licenses or the like in response to a request from the receiving terminal 60. The content communication processing section 21 in

15 the receiving terminal 60 communicates with the content server 40 and obtains contents. The license communication processing section 22 in the receiving terminal 60 communicates with the license server 50 and obtains view licenses.

[0057] FIG. 10 is a flowchart showing procedures of the method

20 of license management performed by the receiving terminal 60. When presentation of a new resource is requested by a user via the operation section 24 (step S801), the receiving terminal 60 obtains the specified new resource from the content server 40 (step S1002). The receiving terminal 60 determines whether or not the obtained

25 new resource is a startup document (step S803). When the new

resource is not a startup document (step S803, No), the receiving terminal 60 proceeds to step S811 at which a decryption key for the new resource specified by a user is identified.

[0058]   When the new resource is a startup document (step S803, Yes), the receiving terminal 60 obtains a license-corresponding document from the content server 40 in accordance with a description of the startup document (reference destination information) (step S1004).   The receiving terminal 60 stores the obtained license-corresponding document in the license-corresponding document storage section 26 (step S805). Next, the receiving terminal 60 selects one piece of license information from a plurality of pieces of license information described in the stored license-corresponding document (step S806).   The receiving terminal 60 stores a license ID described in the selected one piece of license information into the license-corresponding document storage section 26 (step S807). After the license ID has been stored, the receiving terminal 60 determines whether or not a view license corresponding to the license ID is held, i.e., whether or not the view license has already been stored in the license storage section 27 (step S808). If not already stored, the receiving terminal 60 obtains the corresponding view license from the license server 50, stores in the license storage section 27, and sets the corresponding view license for content view processing (step S1009). After the view license has been set, the receiving terminal 60 obtains an upper-level resource in accordance

with a description of the startup document (reference destination information) from the content server 40 (step S1010).

[0059]   And based on the view license set for content view processing, the receiving terminal 60 identifies a decryption key to decode the new resource obtained at step S1002 or the upper-level resource obtained at step S1010 (step S811). After the decryption key has been identified, the receiving terminal 60 performs decryption of the resource by using this decryption key (step S812). This decrypted resource is screen-displayed on the presentation section 25 (step S813).

[0060]   As described above, also in the content distribution system and the license management method according to the second embodiment of the present invention, the receiving terminal can easily grasp that once license information is provided, all resources presented belong to the same content until the next license information is newly provided. Thus, it is not required to perform license matching processing for checking whether or not a resource belongs to a content having a view license each time a resource to be viewed is altered.

[0061]   (third embodiment)

FIG. 11 is a schematic block diagram illustrating a content distribution system according to a third embodiment of the present invention. In FIG. 11, the content distribution system according to the third embodiment comprises a server 10 on the side of a service provider and a receiving terminal 70 on the side

of a user, which are interconnected via a communication path 30 such as network or the like. The server 10 comprises a communication processing section 11, a content storage section 12, and a license storage section 13. The receiving terminal 70

5 comprises a communication processing section 21, a presentation processing section 23, an operation section 24, a presentation section 25, a license-corresponding document storage section 26, a license storage section 27 and a content storage section 28.

[0062]   As shown in FIG.11, the content distribution system

10 according to the third embodiment is different from that according to the first embodiment in that the content storage section 28 is further added to a receiving terminal 20. With a focus on the difference, the content distribution system according to the third embodiment will be described.

15 [0063]   In the content storage section 28, before a presentation request of a content is made, contents 281, 282, ··· obtained by previous downloading or the like from the server 10 are stored. Therefore, in this license management method, the receiving terminal 70 do not obtain resources from the server 10, unlike

20 at step S802 and step S810 shown in FIG. 8.

[0064]   As described above, also in the content distribution system and the license management method according to the third embodiment, the receiving terminal can easily grasp that once license information is provided, all resources presented belong

25 to the same content until the next license information is newly

provided. Thus, it is not required to perform license matching processing for checking whether or not a resource belongs to a content having a view license each time a resource to be viewed is altered.

5 [0065] As is seen in the content distribution system shown in FIG 11, it is not particularly important in the present invention where contents are arranged. In other words, if a method in which a user specifies a resource contained in a piece of content and a description method for specifying the resource from other

10 resource have been decided and there is a structure where a receiving terminal can obtain the resource based on the specifying, the present invention is applicable, wherever resources are arranged. In the system structure shown in FIG. 3, for example, a method for specifying a resource is a method using URL such as

15 http://sample4foo.panasonic.jp/content5531/images/c.jpg and a method in which a receiving terminal obtains a resource is a method using HTTP. And in the system structure shown in FIG. 11, a method for specifying a resource is the method using URL such as "file://····" used in general, and a method in which the receiving

20 terminal obtains a resource is to access a hard disk or the like in a very general manner.

[0066] Accordingly, resources contained in a content may be arranged in a plurality of content servers in a dispersed manner and only a part of the resources may be previously obtained in

25 an apparatus such as a hard disk device. Here, the present

invention does not particularly focus on a method for previously obtaining resources contained in a piece of content into an apparatus such as a hard disk device and any methods may be employed. There are methods known in general: resources may be obtained from

5   a Web server through communication by using HTTP; resources may be obtained from broadcasting signals through reception of digital broadcasting; and recording media such as DVD or the like may be used.

INDUSTRIAL APPLICABILITY

10   [0067]   The present invention is applicable to a content distribution system in which encrypted contents are subjected to decryption by using predetermined view licenses and in particular, is well-suited, for example, to a case where license management of a plurality of resources contained in a content is performed

15   for each content in a collective manner.